Life history and essential habitats of humpback whitefish in Lake Clark National Park, Kvichak River watershed, Alaska

Abstract: Humpback whitefish *Coregonus pidschian* research was conducted during 2006 within the Lake Clark watershed in response to a decline in subsistence harvests. The most successful sampling gear tested for humpback whitefish in Lake Clark were seines and gillnets in shallow (<5 m) areas that were pre-baited with preserved salmon eggs. Juvenile humpback whitefish (age 0 to 3) were generally in shallow (<3 m) areas of both Chulitna Bay and Long Lake, whereas older individuals were captured across a wider range of habitat types and depths. A total of 809 humpback whitefish were sampled and most (649) were juveniles. Total lengths of sampled fish ranged between 95 and 584 mm. Age estimates from otoliths and scales were usually similar for individuals with total lengths between 82 to ≤ 230 mm, but usually differed for individuals longer than 400 mm. In general, estimated otolith ages were greater than estimated scale ages for the same individual, and less variation was observed between two readings of the same otolith than between two readings of the same scale. Microchemical composition analysis to detect strontium (Sr) levels in otoliths was done for 10 humpback whitefish, since high peaks in Sr can be used as an indicator of anadromy in fishes. No definitive spikes in Sr concentrations were observed, although otoliths from four humpback whitefish showed greater variation in Sr concentrations than generally observed in non-anadromous fishes. These four fish may have made extensive vertical movement within Lake Clark, as deep waters are often chemically distinct from surface waters, or could have resided in very low salinity coastal waters.

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